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(54) Dynamic system of survey and selection of treatments of cellulite

(57) A system is described that allows to identify the area of the body affected by cellulite using microencapsulated liquid crystal thermodetectors that are elastic, flexible, or rigid which provides a thermal map of the surveyed area and to select the most appropriate treatments by means of a synoptic table that indicates, for each type of image displayed on the thermodetector, corresponding to a determined phase of the pathology and/or of the unaestheticism, the most adequate treatments for such a phase, subdivided in products, manipulations, physical exercises, and professional and medical systems.

FIG. IB

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Description

The present invention regards a dynamic survey system of thermal signals by the cellulite that permits a) identification of the zones affected by cellulite b) to classify the cellulite in four thermographic phases, c) to choose the preventive and/or curative treatment most appropriate according to the detected phase, in a simple and utilizable manner not only by professional doctors, paramedics and cosmetologists, but also by the simple patient.

Cellulite is a pathology that affects most women in determined areas (thighs, glutes, abdominals, internal knee, shoulders, arms, ecc.) causing progressive alterations of the microcirculatory system.

The cellulitic process has a very slow development. Generally it begins with a dilation of the capillaries (stagnant blood) followed by plasma emission (flooding of the tissues - edema). As time passes it fosters a natural process of defense for the fatty tissues, that are brought to the formation of the micronodule. The fusion of more micronodules finally produces the macronodule or cellulitic nodule, noticeable to palpation and painful to pressure.

These alterations cause variations of temperature: the areas with stagnant blood and edema are hotter, while the nodules are colder than the surrounding areas.

In order to understand if a region of the body is affected by cellulite, therefore, it is important to have recourse to a method that permits the detection of these modifications of temperature. Such method is the contact thermography with microencapsulated liquid crystals, technically easy and quickly executed, repeatable and above all harmless.

The system of the present invention utilizes this technique through a microencapsulated liquid crystal (E.L.C.) dynamic detector that, applied on the surface of the body being tested, assumes different colorations, providing a true and actual "thermal map" of that area.

In order to execute the detection and to choose the most appropriate treatment the system of the present invention utilizes two fundamental articles, namely a dynamic thermodetector and a synoptic table, that come schematically illustrated in the attached sheets of drawings in which:

Fig. 1A shows a professional medical device with photographic recording of the thermographic image;

Fig. 1B shows the thermodetector for personal application on an area of the body being tested;

Fig. 1C shows a detector for professional use by cosmetologists;

Fig. 2 shows the synoptic table in an embodiment for professional operators; and

Fig. 3 shows the synoptic table in an embodiment for personal use.

The dynamic thermodetectors shown in Fig. 1A, 1B, and 1C are of the type that are already normally used for other diagnostic inquiries, constituted from a flexible support on which a coating of microencapsulated liquid crystals for thermography is applied.

As is known, the liquid crystals have the property of changing color with the variation of temperature, and today high sensitivity liquid crystals are available that permit the displaying of temperature differentials up to 0,2° C. Each color of the liquid crystals represents a different temperature and appears according to a precise chromatic scale, from the lowest (brown-red) to the highest (green-violet-blue) temperatures.

In order to carry out in practice the detection, the thermodetector is applied on the skin of the areas to be examined. One waits for the stabilization of colors (about 10-20 seconds) before proceding to the interpretation of the image. The image that is formed on the thermodetector gives indications on the presence of thermal signals by the cellulite, permitting the accurate detection of the first cellulite signs (difficult to be detected by other means), the phase and the type of cellulite and the exact position of the cellulitic areas.

Comparing the image on the thermodetector with that reported in the interpretive table showed in Fig. 2 and 3, it is possible to establish the presence or absence of the thermal signals of the cellulite, classified in four principal phases, thus being able to select the most effective treatment in respect of such phases. It must be pointed out that it is not so important to observe which colors appear on the thermodetector, as much as the image that is formed, and in particular it needs to be kept in mind that a uniform image indicates normality (absence of thermal signals of the cellulite) while a spotted image indicates the presence of thermal signals of the cellulite.

The synoptic table of Fig. 2 and 3 represent the main and innovative advantageous means of the system according to the present invention. This is divided into two sections, more particularly the detection section, in which the characteristic images of normality and of the four principal phases of cellulite are illustrated, and the section showing the treatments to be selected, paired to each image of the detection section.

The treatment section is then subdivided into three or more columns, that suggest respectively the products, the manipulations and the physical exercises, and in the tables for professional and medical use (see Fig. 2) also the mechanical, electronic, ecc. systems being employed, corresponding to each surveyed phase. The table is finally able to be completed by illustrations (see Fig. 3) showing the massage techniques suggested in order to put into practice the suggestions of the manipulation treatment column.

Turning now to illustrate in greater detail the significance of the characteristic images that form on the thermodetector, the first or top box illustrates the thermographic uniform image; it displays a homogeneous coloration of one or two colors which appears prev-

alent on the thermodetector; an image of this type indicates a condition of normality or absence of the typical thermal signals of the cellulite.

The second box illustrates the hazy spotted images, corresponding to the I-II phase of the cellulite; this displays the presence of some big color spots with vague margins, often connected to each other; an image of this type is indicative of the first phases of cellulite, namely the edema.

The third box illustrates "the leopard skin image", corresponding to the III phase of the cellulite; this displays the presence of numerous sharp spots of different colors; an image of this type is indicative of thermal signals of cellulite with small nodules (micronodules).

The fourth and last box illustrates "the black spotted image", corresponding to the IV phase of the cellulite; this displays the presence of sharp colored spots near brown/black areas; this is the thermal sign of an advanced phase of the cellulite, characterized by the presence of large nodules (macronodules) with little or no vascularization.

The thermographic test may be repeated for an unlimited number of times, so as to check the advancement of the pathology. The test is clearly not invasive and is lacking contra-indications.

Therefore it results that, comparing the formed image on the thermodetector with the illustrative images of the table and checking the columns of the treatment section corresponding to the equivalent image to that of the thermodetector, one has the immediate response to the relevant question and the most appropriate suggestion for the following treatments.

The specific brand of the products will be able to be suggested by the trusted professional whether it is a physician, pharmacist, therapist or cosmetologist. In any case, the products that are applied alone, mixed or in combination, using the massage techniques advised, according to the cellulite phase detected, belong in a non-limiting manner to the following specialty categories:

- Decongestant products in order to reduce the intensity of the edema and to help the reabsorption across all the lymphatic vessels.
- Moisturizing products in order to restore hydration and elasticity of the skin.
- Invigorating products and lipolytics in order to assist in the reduction of volume of the adipocytes and in order to intensify the invigoration of the muscular fibres.
- Toninig-up products in order to maintain the elasticity of the skin and to prevent the anti-aesthetic effects that may occur in view of loss of weight or reduction of measures (for example reduction of the circumference of the leg because of adiposity reduction and the absorption of the edema).
- Vasotonic products in order to assist in the oxygenation of the tissues and to augment the volume of the capillaries and the speed of the blood supply.

As to the massage, which is the principal component of an effective treatment of the cellulite, the fundamental techniques to be followed, indicated in a non-limiting manner also schematically at the bottom of the table, are the rub down, the support to the microcirculation with movement of the hands in the sense of the venous flow, the softening action by means of spotting, the kneading by means of light rythmic compression of the skin, the disassociation through traction in opposite directions of an epidermic fold, the drainage massage.

As far as the physical exercises are concerned, these are mostly those followed in order to gain back the figure, with warm-up movements and stretching, specific physical exercises for the various body parts such as thighs, calves, arms, shoulders, sides, glutes, and pectorals.

Finally as to the medical systems to be used, one can mention in a non-limiting manner the mechanical or electronic sequential lymphedrainage pressure therapy, electrolypolysis (by needles or plates), localized ultrasounds on the edematous and/or nodular areas, balneotherapy at various temperatures, localized mesotherapy with vaso-trophic, antiedema, lipolytic and/or fibrolytic products according to the specific case, passive warm-ups and ionophoresis penetration of the products and of the active substances.

From the foregoing it is to be understood that the system of the present invention represents the method of detection and selction of the most complete treatment that responds to the greatest part of the problems caused by the complete cellulitic pathology, and it has also to be pointed out that the layout of the sections on the illustrated table displayed in the attached drawing is simply exemplificative and therefore variations may be resorted to it without altering the fundamental concept of accompanying thermographic images with the advised treatments for the corresponding cellulitic phases.

Claims

1. Dynamic system of survey and selection of treatments of cellulite, characterized by the fact of including an elastic, flexible or rigid thermodetector of microencapsulated liquid crystals, that assumes different colorations when applied to the surface of the body being examined, providing a thermal map of the examined area, as well as a synoptic table associating to each type of image displayed on the thermodetector, a selection of advised treatments for the type of cellulitic pathology indicated by such an image.

2. System according to claim 1, characterized by the fact that the thermodetector consists of a layer of high sensitivity microencapsulated liquid crystals that allows for the displaying temperature differentials up to 0,2°C.

3. System according to claim 1, characterized by the fact that the synoptic table is divided into two sections, of which one dedicated to the detection, illustrates the characteristic images of normality and of four principal phases of the cellulite, and the other dedicated to the treatments being chosen, joined to each image of the detection section.

4. System according to claim 3, characterized by the fact that the section of the treatments is further subdivided into three or more columns, that suggest in a non-liniting manner the products respectively being used, the manipulations and the physical exercises being carried out, and in the professionally used tables also the medical-aesthetic systems being employed, corresponding to each detected phase.

5. System according to claim 3, characterized by the fact that the table also contains a series of illustrations displaying the advised massage techniques in order to put into practice the manipulation column of the treatments.

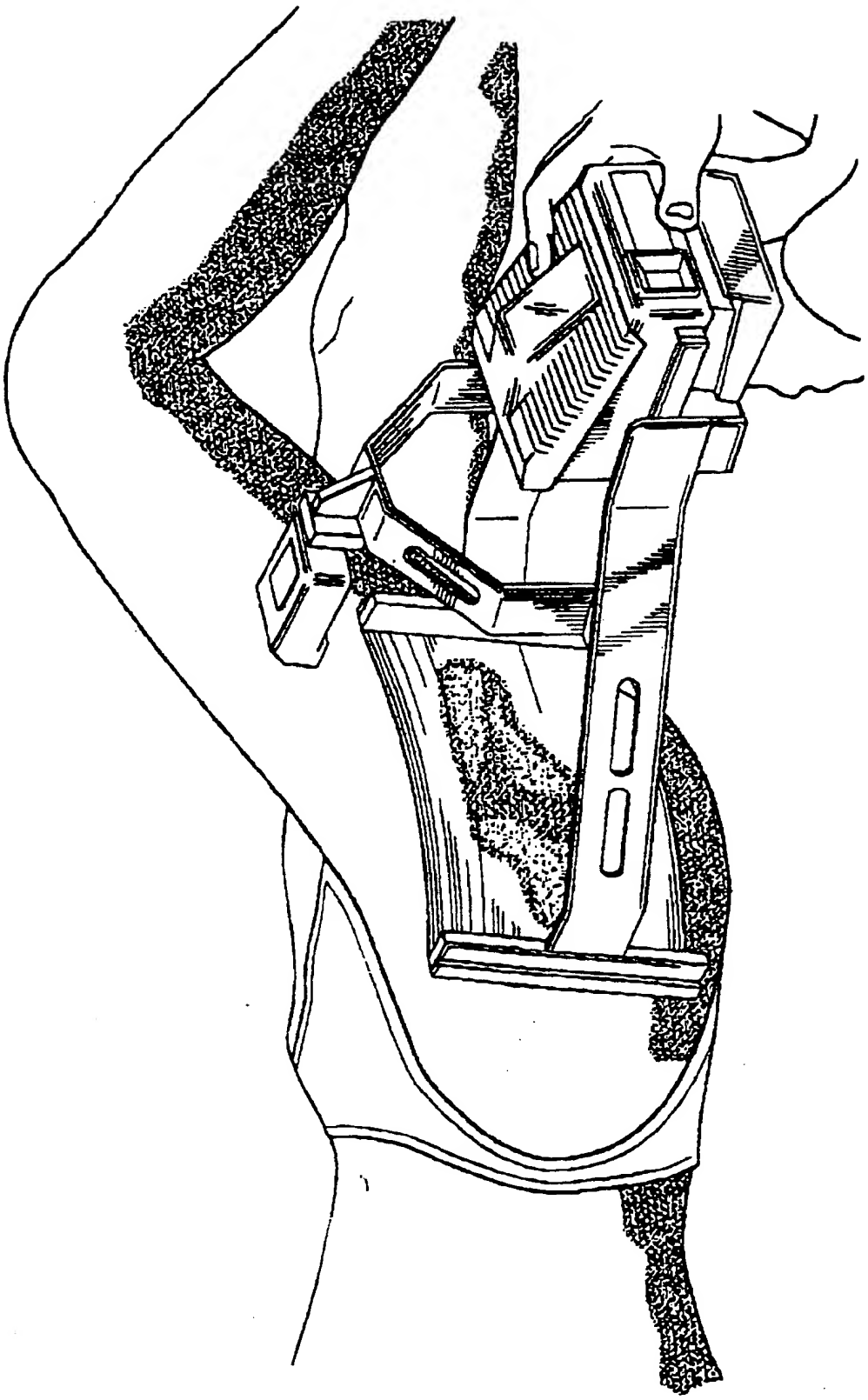

FIG. IA

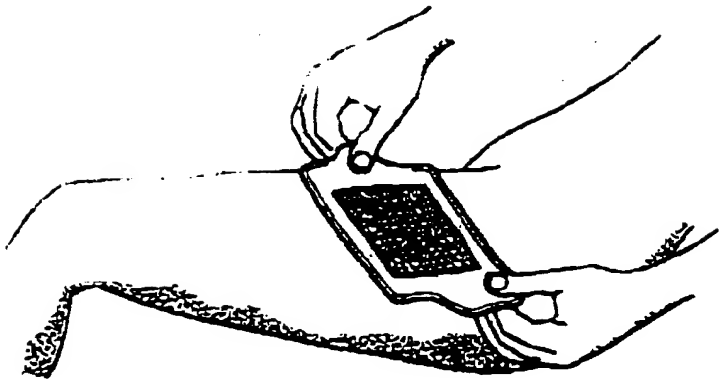

FIG. IB

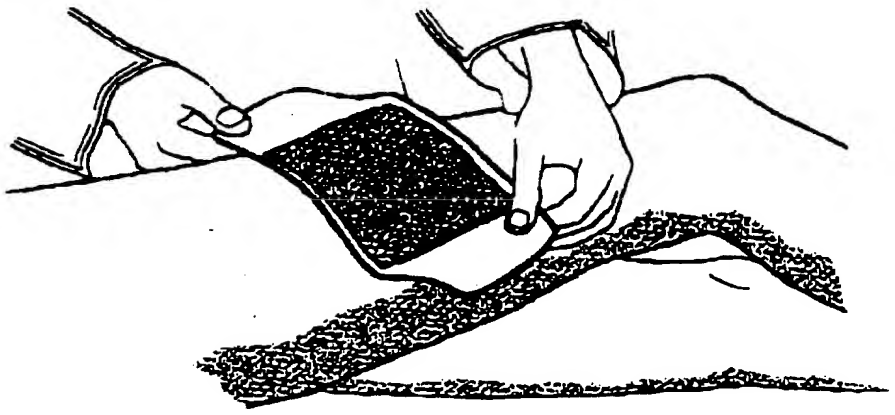

FIG. IC

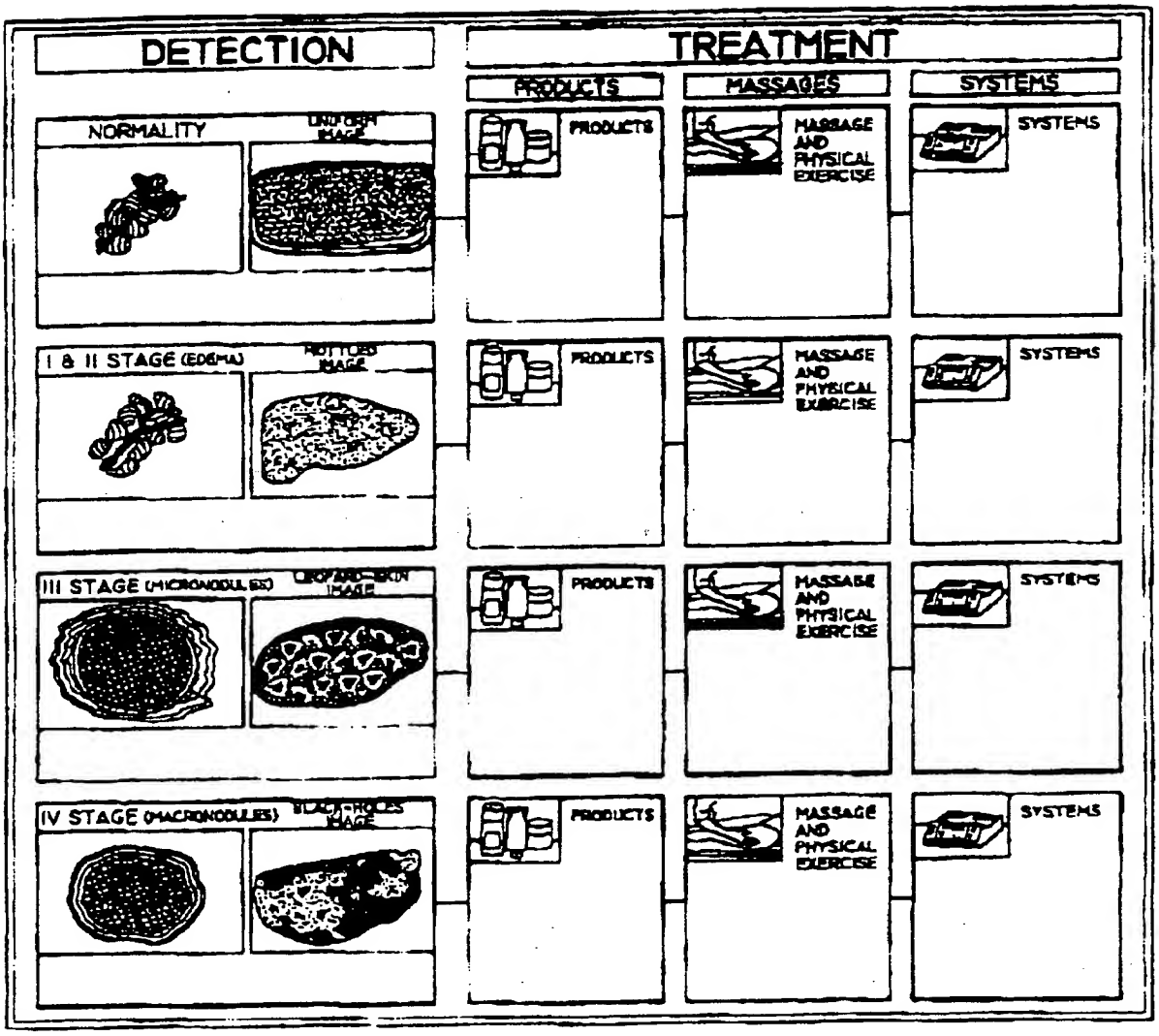
DETECTION
TREATMENT
PRODUCTS
MASSAGES
SYSTEMS
NORMALITY
PRODUCTS
MASSAGE AND PHYSICAL EXERCISE
SYSTEMS
I & II STAGE (EDEMA)
PRODUCTS
MASSAGE AND PHYSICAL EXERCISE
SYSTEMS
III STAGE (MICRONODULES)
PRODUCTS
MASSAGE AND PHYSICAL EXERCISE
SYSTEMS
IV STAGE (MACRONODULES)
PRODUCTS
MASSAGE AND PHYSICAL EXERCISE
SYSTEMS

FIG. 2

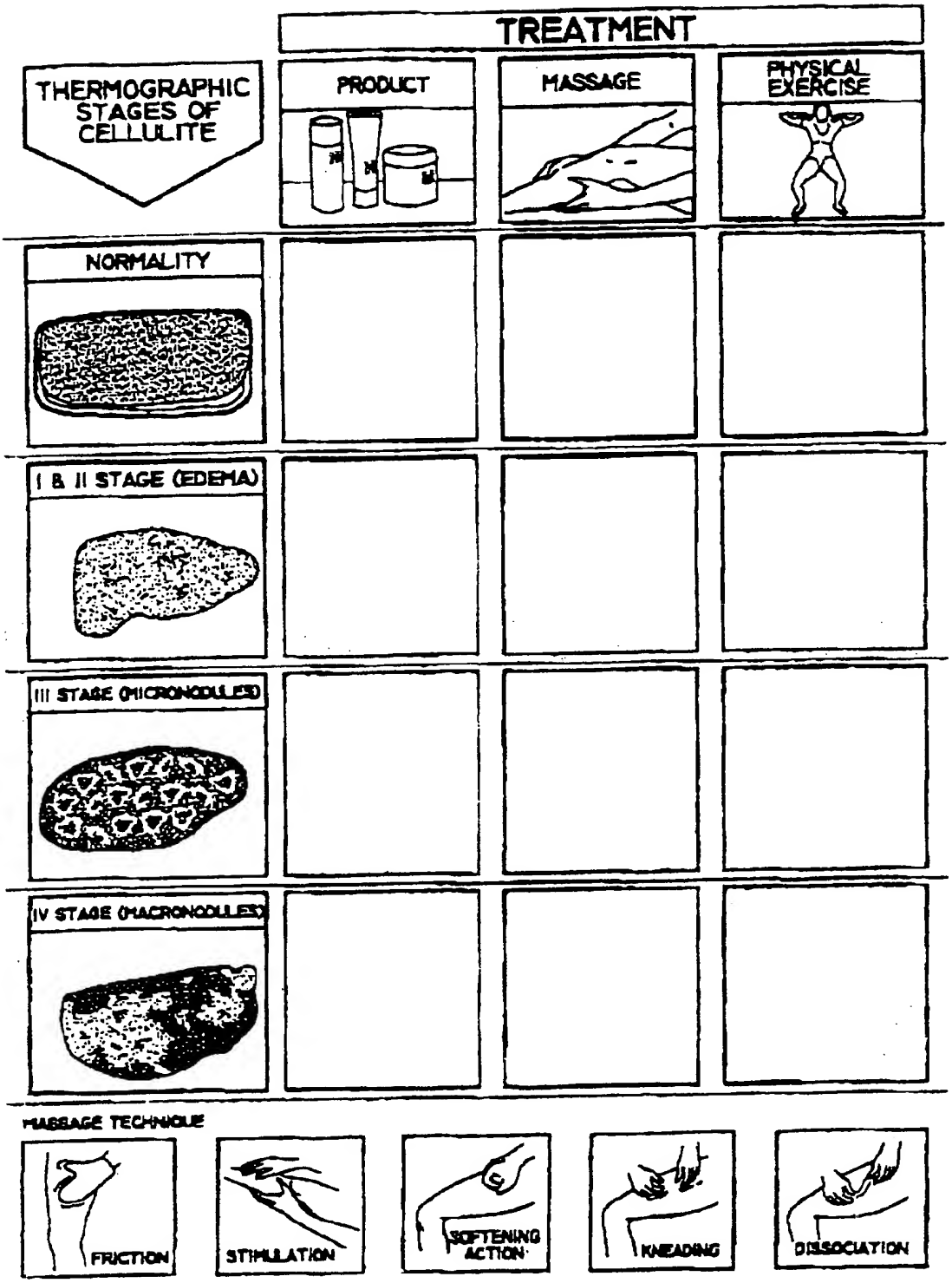
TREATMENT
THERMOGRAPHIC STAGES OF CELLULITE
PRODUCT
MASSAGE
PHYSICAL EXERCISE
NORMALITY
I & II STAGE (EDEMA)
III STAGE (MICRONODULES)
IV STAGE (MACRONODULES)
MASSAGE TECHNIQUE
FRICTION
STIMULATION
SOFTENING ACTION
KNEADING
DISSOCIATION

FIG. 3

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 96 20 1357

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
A	US-A-4 217 373 (FRIEDRICH JENNEN ET AL) * column 1, line 7 - line 58; table 1 * ---	1,2	A61B5/00
A	US-A-3 830 224 (RICCARDO VANZETTI ET AL) * column 1, line 62 - column 2, line 9 * * column 2, line 49 - column 3, line 30; table 1 * ---	1	
A	GB-A-2 086 575 (ALDO COLOMBO) * page 1, line 72 - line 83 * * page 3, line 79 - line 89; table 1 * -----	1	

TECHNICAL FIELDS SEARCHED (Int.Cl.6)

A61B
G01K

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
BERLIN	27 August 1996	Weihs, J

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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